

P a t e n t C l a i m s :

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1. A method of estimating the pitch of a speech signal
5 (2), said method comprising the steps of:
 - dividing the speech signal into segments,
 - calculating for each segment a conformity function for the signal, and
 - detecting peaks in the conformity function,
 - 10 c h a r a c t e r i z e d in that the method further comprises the steps of:
 - estimating an average distance between said peaks, and
 - using the estimate of said average distance as an estimate of the pitch.
 - 15 2. A method according to claim 1, c h a r a c t e r - i z e d in that it further comprises the steps of:
 - sampling the speech signal to obtain a series of samples, and
 - performing said division into segments such that each segment has a fixed number of consecutive samples.
 - 20 25 3. A method according to claim 1 or 2, c h a r a c t e r i z e d in that it further comprises the steps of:
 - estimating a set of filter parameters using linear predictive analysis (LPA),
 - 30 • providing a modified signal (26) by filtering the speech signal through a filter based on said estimated set of filter parameters, and
 - calculating said conformity function of the modified signal.

4. A method according to any one of claims 1 to 3, characterized in that said conformity function is calculated as an autocorrelation function.
- 5 5. A method according to any one of claims 1 to 4, characterized in that it further comprises the steps of:
- calculating for each peak in the conformity function the difference between the position of the peak and the estimate of said average distance, and
 - providing an improved estimate of the pitch by selecting as the improved estimate the position of the peak having the smallest value of said difference.
- 15 6. A method according to claim 5, characterized in that it further comprises the step of:
- selecting, if the peak having the smallest value of said difference is represented by a number of samples, the sample having the maximum amplitude of said conformity function as said improved estimate of the pitch.
- 25 7. Use of the method according to any one of claims 1 to 6 in a mobile telephone.
8. A device adapted to estimate the pitch of a speech signal (2), and comprising:
- means (3) for dividing the speech signal into segments,
 - means (5) for calculating for each segment a conformity function for the signal, and
 - means (6) for detecting peaks in the conformity function,
- 30 characterized in that the device is further adapted to:
- estimate an average distance between said peaks, and

- use the estimate of said average distance as an estimate of the pitch.
9. A device according to claim 8, characterized in that it further comprises:
- means (3) for sampling the speech signal to obtain a series of samples, and
 - means for performing said division into segments such that each segment has a fixed number of consecutive samples.
10. A device according to claim 8 or 9, characterized in that it further comprises:
- means (4; 24) for estimating a set of filter parameters using linear predictive analysis (LPA),
 - means (4; 25) for providing a modified signal by filtering the speech signal through a filter based on said estimated set of filter parameters, and
 - means (5) for calculating said conformity function of the modified signal.
11. A device according to any one of claims 8 to 10, characterized in that said conformity function is an autocorrelation function.
12. A device according to any one of claims 8 to 11, characterized in that it further comprises:
- means for calculating for each peak in the conformity function the difference between the position of the peak and the estimate of said average distance, and
 - means for providing an improved estimate of the pitch by selecting as the improved estimate the position of the peak having the smallest value of said difference.

13. A device according to claim 12, characterized in that it is further adapted to select, if the peak having the smallest value of said difference is represented by a number of samples, the sample having the 5 maximum amplitude of said conformity function as said improved estimate of the pitch.

14. A device according to any one of claims 8 to 13, characterized in that the device is a mobile telephone. 10

15. A device according to any one of claims 8 to 13, characterized in that the device is an integrated circuit.

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